WHAT IS CLAIMED IS:

| 2. The system according to claim 1 wherein upon receiving the fault report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 1 | 1. A system for detecting faults in an optical network, comprising: | | | | | |
|--|---|--|--|--|--|--|--|
| amplifier node configured to detect a fault on an optical link connecting the amplifier node and the first node and generate a fault report upon detection of the fault, the amplifier node is further configured to forward the fault report to the second node. 2. The system according to claim 1 wherein upon receiving the fault report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 2 | a first node and a second node; and | | | | | |
| and the first node and generate a fault report upon detection of the fault, the amplifier node is further configured to forward the fault report to the second node. 2. The system according to claim 1 wherein upon receiving the fault report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 3 | an amplifier node coupled between the first node and the second node, the | | | | | |
| 2. The system according to claim 1 wherein upon receiving the fault report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 4 | amplifier node configured to detect a fault on an optical link connecting the amplifier node | | | | | |
| 2. The system according to claim 1 wherein upon receiving the fault report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 5 | and the first node and generate a fault report upon detection of the fault, the amplifier node is | | | | | |
| report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 6 | further configured to forward the fault report to the second node. | | | | | |
| report from the amplifier node, if the second node is capable of switching traffic, the second node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 1 | The system according to alaim 1 whomin we are sixting the Conte | | | | | |
| node initiates a switching action to restore traffic between the first node and the second node; and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | | , and it is a second superior of the second s | | | | | |
| and if the second node is not capable of switching traffic, the second node forwards the fault report to a third node. 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: 3 detect a fault on an optical link carrying optical signals into the second node; and 4 upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: 7. The system according to claim 1 wherein the optical network is a bi- | | | | | | | |
| 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | | | | | | | |
| 3. The system according to claim 2 wherein the fault report is forwarded until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: 3 detect a fault on an optical link carrying optical signals into the second node; and 4 upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: 7. The system according to claim 1 wherein the optical network is a bi- | 4 | and if the second node is not capable of switching traffic, the second node forwards the fault | | | | | |
| until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 5 | report to a third node. | | | | | |
| until the fault report is received by a node which is capable of switching traffic. 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 1 | 3. The system according to claim 2 wherein the fault report is forwarded | | | | | |
| 4. The system according to claim 1 wherein the second node is capable of switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 2 | , and the same and | | | | | |
| switching traffic and is configured to: detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | | 1 | | | | | |
| detect a fault on an optical link carrying optical signals into the second node; and upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 1 | 4. The system according to claim 1 wherein the second node is capable of | | | | | |
| upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 2 | switching traffic and is configured to: | | | | | |
| upon receipt of the fault report from the amplifier node, prioritize the fault report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 3 | detect a fault on an optical link carrying optical signals into the second node; | | | | | |
| report and the fault detected by the second node. 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 4 | and | | | | | |
| 5. The system according to claim 1 wherein the amplifier node is further configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 5 | upon receipt of the fault report from the amplifier node, prioritize the fault | | | | | |
| configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 6 | | | | | | |
| configured to receive and pass a fault report from another amplifier node to the second node. 6. The system according to claim 1 wherein the amplifier node is configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. 7. The system according to claim 1 wherein the optical network is a bi- | 1 | 5 The system according to claim 1 wherein the amplifier node is further | | | | | |
| 1 6. The system according to claim 1 wherein the amplifier node is 2 configured to: 3 receive a fault report from another amplifier node; 4 prioritize the received fault report and the generated fault report; and 5 forward whichever fault report that has a higher priority to the second node. 1 7. The system according to claim 1 wherein the optical network is a bi- | | | | | | | |
| configured to: receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. The system according to claim 1 wherein the optical network is a bi- | _ | configured to receive and pass a fault report from another amplifier node to the second node. | | | | | |
| receive a fault report from another amplifier node; prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. The system according to claim 1 wherein the optical network is a bi- | 1 | 6. The system according to claim 1 wherein the amplifier node is | | | | | |
| prioritize the received fault report and the generated fault report; and forward whichever fault report that has a higher priority to the second node. The system according to claim 1 wherein the optical network is a bi- | 2 | configured to: | | | | | |
| forward whichever fault report that has a higher priority to the second node. The system according to claim 1 wherein the optical network is a bi- | 3 | receive a fault report from another amplifier node; | | | | | |
| 7. The system according to claim 1 wherein the optical network is a bi- | 4 | prioritize the received fault report and the generated fault report; and | | | | | |
| | 5 | forward whichever fault report that has a higher priority to the second node. | | | | | |
| | 1 | 7. The system according to claim 1 wherein the ontical network is a bi- | | | | | |
| 2 directional line switched ring network. | 2 | directional line switched ring network. | | | | | |

| 1 | 8. The system according to claim 1 wherein the fault on the optical link is | | | | | |
|---|--|--|--|--|--|--|
| 2 | detected based on a loss-of-signal condition. | | | | | |
| 1 | 9. The system according to claim 8 wherein the amplifier node | | | | | |
| 2 | comprises: | | | | | |
| 3 | an input signal power detector configured to monitor input power of the | | | | | |
| 4 | optical link; and | | | | | |
| 5 | control logic configured to evaluate output from the input signal power | | | | | |
| 6 | detector to determine if the loss-of-signal condition exists. | | | | | |
| 1 | 10. A method for detecting faults in an optical network having an amplifie | | | | | |
| 2 | node coupled between a first node and a second node, comprising: | | | | | |
| 3 | detecting a loss-of-signal condition on an optical link carrying optical signals | | | | | |
| 4 | from the first node to the amplifier node; | | | | | |
| 5 | causing the amplifier node to generate a fault report reporting occurrence of | | | | | |
| 6 | the loss-of-signal condition; and | | | | | |
| 7 | forwarding the fault report to the second node. | | | | | |
| 1 | 11. The method of claim 10 further comprising: | | | | | |
| 2 | if the second node is capable of switching traffic, causing the second node to | | | | | |
| 3 | initiate a switching action to restore traffic between the first node and the second node; and | | | | | |
| 4 | if the second node is not capable of switching traffic, forwarding the fault | | | | | |
| 5 | report from the second node to another node. | | | | | |
| 1 | 12. The method of claim 11 further comprising: | | | | | |
| 2 | forwarding the fault report until the fault report is received by a node which is | | | | | |
| 3 | capable of switching traffic. | | | | | |
| 1 | 13. The method of claim 10 further comprising: | | | | | |
| 2 | if the second node is capable of switching traffic, detecting a fault on an | | | | | |
| 3 | optical link carrying optical signals into the second node; and upon receipt of the fault report | | | | | |
| 4 | from the amplifier node, prioritizing the fault report and the fault detected by the second | | | | | |
| 5 | node. | | | | | |
| 1 | 14. The method of claim 10 further comprising: | | | | | |

| 2 | causing the amplifier node to receive and pass a fault report from another | | | | | |
|----|--|--|--|--|--|--|
| 3 | amplifier node to the second node. | | | | | |
| 1 | 15. The method of claim 10 further comprising: | | | | | |
| 2 | causing the amplifier node to receive a fault report from another amplifier | | | | | |
| 3 | node; | | | | | |
| 4 | prioritizing the received fault report and the generated fault report; and | | | | | |
| 5 | forwarding whichever fault report that has a higher priority to the second | | | | | |
| 6 | node. | | | | | |
| 1 | 16. The method of claim 10 wherein the optical network is a bi-directional | | | | | |
| 2 | line switched ring network. | | | | | |
| 1 | 17. An optical network comprising: | | | | | |
| 2 | a plurality of switching nodes connected to one another, at least one switching | | | | | |
| 3 | node capable of switching traffic; and | | | | | |
| 4 | a plurality of amplifier nodes; | | | | | |
| 5 | wherein: | | | | | |
| 6 | at least one amplifier node is coupled between selective pairs of | | | | | |
| 7 | switching nodes; and | | | | | |
| 8 | the least one amplifier node is configured to detect a fault on an | | | | | |
| 9 | incoming optical link carrying optical signals into that amplifier node, generate a fault report | | | | | |
| 10 | | | | | | |
| 1 | 18. The optical network of claim 17 wherein: | | | | | |
| 2 | upon receiving the fault report, if the neighboring node is a switching node, | | | | | |
| 3 | the neighboring node initiates a switching action to restore traffic; and if the neighboring | | | | | |
| 4 | node is not a switching node, the neighboring node forwards the fault report to another node. | | | | | |
| 1 | 19. The optical network of claim 18 wherein the fault report is forwarded | | | | | |
| 2 | until the fault report is received by a switching node. | | | | | |
| 1 | 20. The optical network of claim 17 wherein the at least one switching | | | | | |
| 2 | node is configured to: | | | | | |
| 3 | detect a fault on an incoming optical link carrying optical signals into that | | | | | |
| 4 | switching node; and | | | | | |

| J | apon receipt of a fault report from an amplifier flode, prioritize the received | | | | | |
|---|--|--|--|--|--|--|
| 6 | fault report and the fault detected by that switching node. | | | | | |
| 1 | 21. The optical network of claim 17 wherein the at least one amplifier | | | | | |
| 2 | node is further configured to receive and pass a fault report from another amplifier node to a | | | | | |
| 3 | switching node. | | | | | |
| 1 | 22. The optical network of claim 17 wherein the at least one amplifier | | | | | |
| 2 | node is configured to: | | | | | |
| 3 | receive a fault report from another amplifier node; | | | | | |
| 4 | prioritize the received fault report and the generated fault report; and | | | | | |
| 5 | forward whichever fault report that has a higher priority to the neighboring | | | | | |
| 6 | node. | | | | | |
| Ü | node. | | | | | |
| 1 | 23. The optical network of claim 17 wherein the optical network is a bi- | | | | | |
| 2 | directional line switched ring network. | | | | | |
| | 24 The antical materials of dains 17 and arrived a Coult and a fine of | | | | | |
| 1 | 24. The optical network of claim 17 wherein the fault on the incoming | | | | | |
| 2 | optical link is detected based on a loss-of-signal condition. | | | | | |
| 1 | 25. The optical network of claim 24 wherein the at least one amplifier | | | | | |
| 2 | node comprises: | | | | | |
| 3 | an input signal power detector configured to monitor input power of the | | | | | |
| 4 | incoming optical link; and | | | | | |
| 5 | control logic configured to evaluate output from the input signal power | | | | | |
| 6 | detector to determine if the loss-of-signal condition exists. | | | | | |
| | | | | | | |
| 1 | 26. An amplifier node for use in an optical network, comprising: | | | | | |
| 2 | an input signal power detector configured to monitor input power of an | | | | | |
| 3 | incoming optical link received by the amplifier node; and | | | | | |
| 4 | control logic configured to: | | | | | |
| 5 | evaluate output from the signal power detector to determine if a loss- | | | | | |
| 6 | of-signal condition thereby indicating a fault on the incoming optical link; and | | | | | |
| 7 | generate a fault report reporting the loss-of-signal condition. | | | | | |

| 1 | | 27. | The amplifier node of claim 26 wherein the control logic is further | | | |
|---|------------------------------|----------|--|--|--|--|
| 2 | configured to f | orward | the fault report to a switching node to allow the switching node to | | | |
| 3 | initiate a switching action. | | | | | |
| 1 | | 28. | The amplifier node of claim 26 wherein the control logic is further | | | |
| 2 | configured to: | | | | | |
| 3 | : | receive | a fault report from another amplifier node; | | | |
| 4 | | prioriti | ze the received fault report and its own generated fault report; and | | | |
| 5 | | forward | d whichever fault report that has a higher priority to a switching node. | | | |
| 1 | ; | 29. | The amplifier node of claim 26 wherein the optical network is a bi- | | | |
| 2 | directional line | switch | ed ring network. | | | |
| | | | | | | |